Four-Dimensional Representation And Collision Detection For Movingobjects

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Summary

We consider the collision detection problem for general objects. A four-dimensional approach is proposed for this problem which detects exactly and in one-step when and where the earliest collision will occur between the objects. This is done by using four-dimensional sets to represent the objects in both space and time. The problem is then posed as a nonlinear programming problem. The algorithm can handle the case of a rigid body moving on a general path in 2 or 3 with simultaneous translation and rotation. Simulation results on some example problems are given, and show that the algorithm is superior to those available in the literature